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U.S. Drillers Continue Comeback

Except for a slight dip in late September, U.S. drillers are continuing their return to normalcy. Although the accompanying graph doesn't go back far enough to show it, the pattern of this year's activity is almost exactly the same as the pattern created by U.S. drillers in 1979 – the last of the so-called normal drilling years.

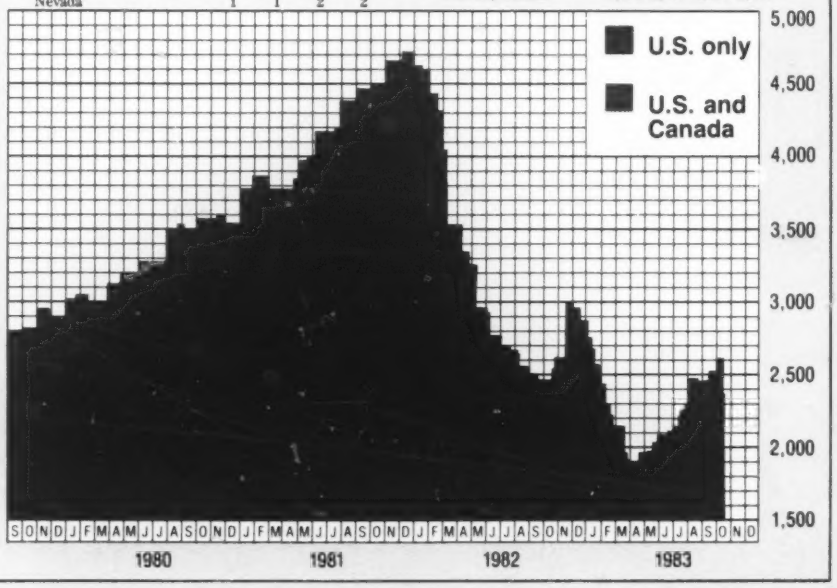
Completions in 1979 totaled 48,523. This year, on the other hand, U.S. completions had already topped 50,000 by the end of August, and they are expected to be more than 50% higher than 48,000 by the end of the year. This year's rig count, however, will top 1979's by only one or two percentage points.

With lots more completions per rig, drillers obviously are doing a better job these days. Most of the credit goes to better planning, more competent rig crews, and a return to footage rates. And you can't blame high completion totals on late reporting forever.

Rotary rigs actually making hole in United States & Canada

As Reported To International Association Of Drilling Contractors By Hughes Tool Co.

	Sept. 19, 1983	Sept. 26, 1983	Oct. 3, 1983	Oct. 10, 1983
Alabama				
Land	10	12	13	18
Inland Waters	1	1	1	1
Offshore	1	1	1	1
Alaska				
Land	9	9	8	6
Offshore	3	4	4	3
Total	12	13	12	9
Arkansas	25	24	26	31
California				
Land	92	85	93	99
Offshore	27	21	21	20
Total	119	106	114	119
Colorado	54	59	50	51
Florida				
Land	3	3	2	2
Offshore	1	1	1	1
Total	4	4	3	3
Hawaii	1	0	0	0
Idaho	4	3	3	3
Illinois	75	67	74	71
Indiana	5	6	6	6
Kansas	131	134	124	134
Kentucky	8	7	11	9
North Louisiana	24	24	28	31
South Louisiana				
Inland Waters	49	47	51	48
Land	87	77	73	80
Offshore	100	102	107	115
Total	260	250	259	275
Michigan	37	33	31	29
Mississippi	29	33	37	35
Montana	26	27	25	33
Nebraska	8	5	10	10
Nevada	1	1	2	2
New Jersey	1	1	1	1
New Mexico	59	65	68	75
New York	12	10	9	9
North Dakota	39	42	47	50
Ohio	48	47	50	42
Oklahoma	253	248	253	264
Pennsylvania	29	30	30	27
South Dakota	1	1	0	1
Tennessee	0	1	1	1
Texas				
Offshore	43	43	40	41
Inland Waters	5	7	10	10
Dist. 1-S. Central Tex.	25	25	25	24
Dist. 2-Middle Tex. Coast	32	36	33	33
Dist. 3-Upper Tex. Coast	97	99	103	106
Dist. 4-Lower Tex. Coast	92	90	92	89
Dist. 5-Northeast Tex.	21	22	26	24
Dist. 6-Far Northeast Tex.	89	89	81	85
Dist. 7B-N. Central Tex.	48	53	46	50
Dist. 7C-W. Central Tex.	54	47	52	50
Dist. 8-Far West Tex.	143	144	151	154
Dist. 8A-West Tex.	66	65	64	66
Dist. 9-North Tex.	82	80	76	74
Dist. 10-Tex. Panhandle	52	57	58	65
Total	849	857	857	871
Utah	39	36	41	40
Virginia	3	3	3	3
Washington	1	1	1	1
West Virginia	28	36	39	44
Wyoming	107	105	110	118
Total U.S.	2,280	2,269	2,312	2,386
Canada	189	183	193	198
Canada-Offshore	17	17	15	17
U.S. and Canada	2,486	2,469	2,520	2,601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NOVEMBER 1983 NUMBER 13 VOLUME 55

ABOUT THE COVER: New tanks in an old field are a sure sign that some form of enhanced recovery is underway. This pig launcher, and part of one battery, are in Texaco's Salem field in Illinois, supporting a polymer flood. (Photo by Jan Golon, Texaco Inc.)

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PRODUCTION IMPROVEMENT REPORT

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25 Marathon Lab Seeks Non-EOR Recovery Improvement
In an exclusive interview, William P. McKinnell Jr. says that Marathon Oil Co. is redoing all of the geology of its highly productive reservoirs to learn more about those parts of the gross section that are nonproductive.

32 How To Estimate In-Situ Combustion Production Cost
by Jacques Burger and Daniel Champion, Institut Français du Pétrole. Because primary production is assumed to be nil, drilling costs are assigned entirely to the combustion project.

46 Minimizing Miscibility Pressure Aids EOR Efforts
by Larry E. Carlisle, Jeff Davis, and Paul B. Crawford, Texas A&M University. Achieving miscibility at low reservoir pressures increases the options and may permit installation of a profitable oil recovery process.

58 What's New ... To Improve Production
Technology and equipment that are having a positive effect on production improvement are described in a special report designed to help readers stay abreast of products pertinent to this month's theme.

Petroleum Engineer® INTERNATIONAL

NEXT ISSUE: The Offshore Operations Report on November 15 will cover a number of innovative projects being carried out around the world.

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PRODUCTION IMPROVEMENT REPORT

64 **Correct Procedures Improve Foam Fracture Treatments**
by David Mack, Clay Terry, and Mike Mooney, The Western Co. of North America. Maximization of liquid phase recovery can only be achieved if the gas and liquid are maintained in a commingled state.

76 **Calculator Helps Determine Cash Flow-Present Worth**
by Joseph W. Yager, Internal Revenue Service. The program multiplies production rates by product prices to arrive at gross incomes. Expenses then are subtracted to arrive at net incomes.

86 **Minicomputer Assists Inventory Management**
by John A. Seehafer, Amoco Production Co. Remote location inventory systems use portable, low-cost minicomputers because small operations often increase in size and scope.

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8,879-88 ft in the Wilcox formation, flowing 39° API gravity oil through a 19/64-in. choke. Flowing tubing pressure was 350 psi.

Mitchell Completes Four North Texas Wells

Mitchell Energy & Development Corp. has completed two oil and gas development wells in North Texas. One, the No. 3 J.M. Robinson A, tested 140 b/d of oil on a 23/64-in. choke with 35 psi flowing tubing pressure. Located in the Boonsville field in Wise County, the well was perforated at 4,643-50 ft.

A second Wise County well, the No. 2 Sally Tully, tested 117 b/d of oil and 1.3 MMcfd of gas on a 21/64-in. choke with 468 psi flowing tubing pressure. Perforated between 5,430 and 5,797 ft, the well is in the Chico West field.

The No. 2 Monroe Caraway, in the Boonsville field, tested 1.6 MMcfd of gas on a 23/64-in. choke with 552 psi flowing tubing pressure. Perforations were at three intervals between 5,142 and 5,958 ft.

In Jack County, the No. 3 Edna Southerland tested 2 MMcfd of gas on a 23/64-in. choke. Flowing tubing pressure was 711 psi, and perforations were between 5,330 and 5,360 ft. The well is located in the Maryetta field.

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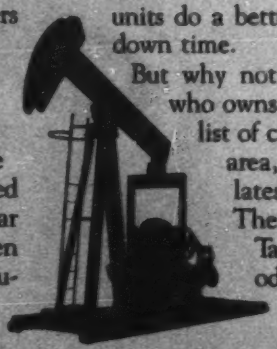

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Letters

TO THE EDITOR:

I would like to point out an error of fact published in the News Hi-lites page of your September issue (p. 1). You quote the president of Reed Rock Bit Co. as saying a recent acquisition makes Reed "the first of the big four bit manufacturers to offer tri-cone, natural diamond, and PDC bits."

That statement is not true. Hughes Tool Division began marketing its "Blue Chip" PDC bits in 1981. The first Hughes natural diamond bit, a "Blue Diamond" HD40, was run in September of 1982 in Beckham County, Oklahoma – almost a year before the statement in question appeared in print.

As far as Tri-cone bits are concerned, Hughes Tool has been the major manufacturer in that market for more than 50 years. Incidentally, "Tri-cone" is a registered trademark of Hughes Tool Co.

Thank you for setting the record straight.

Ronald L. King
Hughes Tool Co.
Houston, Tex.

Corrections

In the September 1983 issue of PEI, there were mistakes and omissions made in "Calculator Solves Casing Problem" by R. G. Munro and Carol Milo which began on page 36. The authors and editors apologize for any inconvenience this may have caused. To receive a copy of the corrections and a printout of the data registers as they should appear before running the program, circle 300 on the reader service card provided at the back of this book.

In the October 1983 issue of PEI, "Pseudotime Function Improves Gas Well Analysis," Reference 3 on page 70 is incorrect. The reference should be to "Application of Pseudotime to Buildup Test Analysis of Low-Permeability Gas Wells With Long-Duration Wellbore Storage Distortion," by W. John Lee and Stephen A. Holditch, *J. Pet. Tech.* (December 1982) page 2877.

205 Rigs Idled By Free World Drillers

International drillers saw more than 200 rigs idled during the August 1982 to August 1983 period of this report, with 25 of them occurring in the final month of the period.

Africa was the big loser, with a decline of 87 active rigs. Latin America

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was down 56 and Europe was third among slumping regions with 51 idled rigs. The South Pacific area was off by 12 rigs. Only the Far East, which was even for the year, and the Middle East, which actually gained a rig, bucked the trend.

Among countries, Algeria was the biggest loser, with a decline of 50 rigs, which puts the country's utilization rate below 50%. Nigeria also experienced a substantial decline, with 56% of the rigs active a year ago being idled.

International Rotary Rig Report, prepared by Hughes Tool Co.
(Figures in parentheses indicate how many of each country's rigs are offshore rigs.)

	August 1982	July 1983	August 1983
Africa			
Algeria	90	40	40
Angola	13(10)	14(12)	10(8)
Benin	1(1)	1(1)	1(1)
Cameroun	7(6)	5(5)	5(5)
Chad	0	0	1
Gabon	11(9)	7(7)	6(6)
Guinea	0	0	1(1)
Ivory Coast	4(4)	2(2)	1(1)
Libya	28(1)	27(2)	27(2)
Morocco	5	5	5
Niger	1	0	0
Nigeria	30(13)	18(7)	17(7)
Rep. of Congo	7(6)	4(4)	4(4)
Rep. of Zaire	2(1)	1	2(1)
Senegal	1	0	0
Sierra Leone	1(1)	0	0
South Africa	2(2)	2(2)	2(2)
Sudan	2	5(1)	5(1)
Tanzania	0	1	1
Tunisia	11(3)	5(2)	5(2)
	218(58)	137(45)	131(40)
Europe			
Austria	8	9	9
Denmark	2(2)	5(4)	5(4)
France	19	19(1)	19(1)
Germany	31	24	24
Greece	4(2)	3(1)	3(1)
Holland	23(15)	16(10)	16(10)
Ireland	1(1)	3(3)	2(2)
Italy	43(7)	20(5)	20(5)
Norway	12(12)	10(10)	10(10)
Portugal	1	1	1
Spain	11(5)	8(3)	8(3)
Switzerland	1	0	0
United Kingdom	51(50)	41(38)	43(40)
Yugoslavia	25	21(2)	21(2)
	232(94)	180(77)	181(78)
Far East			
Bangladesh	7	2	2
Brunei	8(6)	10(7)	9(7)
Burma	33	41(1)	35(1)
India	51(11)	56(14)	56(15)
Indonesia	94(33)	91(24)	84(24)
Japan	19(1)	23(2)	22(2)
Malaysia	12(12)	9(9)	11(11)
Pakistan	17	17	17
Philippines	13(3)	9	8
Taiwan	5	11(1)	9(1)
Thailand	8(5)	14(7)	14(7)
	267(71)	283(65)	267(68)
Latin America			
Argentina	66	80	83
Barbados	1	1	1
Bolivia	12	8	8
Brazil	90(28)	81(31)	77(25)
Chile	7(3)	6(3)	6(3)
Colombia	17	15	18
Costa Rica	0	1	1
Ecuador	5(1)	4	4
Guatemala	3	1	1
Mexico	194(23)	188(26)	185(32)
Peru	22(6)	17(6)	19(6)
Trinidad	14(5)	8(3)	8(3)
Venezuela	72(19)	41(11)	36(11)
	503(85)	451(80)	447(80)
Middle East			
Abu Dhabi	42(24)	34(23)	31(21)
Bahrain	1	2	2
Dubai	3(3)	7(5)	8(6)
Egypt	39(25)	31(17)	30(13)
Iran	0	19(2)	19(2)
Iraq	5	25	25
Jordan	0	3	3
Kuwait	5	5	5
Oman	12(2)	8	8
Qatar	5(2)	4(2)	4(2)
Ras Al Khaimah	2(1)	0	0
Saudi Arabia	27(11)	29(14)	29(14)
Sharjah	3	1	1
Syria	15	14	14
Turkey	43	24	24
Umm Al Qaiwain	1	1	1
	203(68)	207(63)	204(58)
South Pacific			
Australia	35(8)	18(6)	21(5)
Fiji	1	0	0
New Zealand	1	2	2
Papua New Guinea	0	2(2)	2(1)
	37(8)	22(8)	25(6)
Totals	1,460 (384)	1,280 (338)	1,255 (330)

MEETING CALENDAR

November

7-17 Engineering Foam Fire Protection Systems Design I seminar, sponsored by National Foam Systems Inc. Contact Paul Gillespie, National Foam Systems Inc., 150 Gordon Drive, Lionville, Pa. 19353, (215) 363-1400.

8-9 Offshore Safety – Emergency Shut-Down Systems and Offshore Crane Operations, to be held at the Hyatt Carlton Tower Hotel, London. Contact Miss Lesley Claff, Oyez Scientific and Technical Services Ltd., Bath House (3rd Floor), 56 Holborn Viaduct, London ECIA 2EX.

9-10 Enhanced Oil Recovery – For Independents, sponsored by the Institute for the Study of Earth and Man at Southern Methodist University, to be held at the Fairmont Hotel, Dallas, Tex. Contact the ISEM at Southern Methodist University, Dallas, Tex. 75275, (214) 692-2425.